QLOGIC®
The Ultimate in Performance

DATA SHEET

QLogic 5600Q/5602Q

Fibre Channel Stackable Switch

Overview

Now the benefits of stackable IP switches are available for high-performance 4Gb Fibre Channel SANs. QLogic 5600Q Series Stackable Switches deliver the performance and seamless scalability of a modular chassis switch in an easy-to-manage, pay-as-you-grow solution.

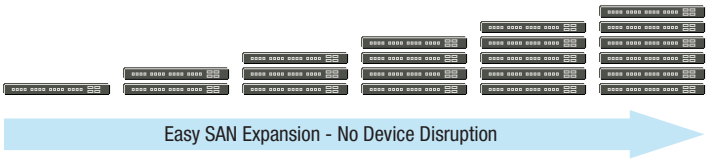
- Entry as low as eight 4Gb device ports
- Single-switch expansion to sixteen 4Gb device ports—plus four 10Gb stacking ports (20 ports total)
- Multi-switch expansion to 96 device ports per stack
- Single (SB5600Q) and dual-power supply (SB5602Q) options

Highlights

- Affordable Now—Big Savings Later
  - Low initial cost
  - Reduced expansion costs
  - Longer product and topology lifespan
- Powerful, Intuitive Software
  - QuickTools™ (included)
  - Fabric Security (included)
  - Enterprise Fabric Suite™ (optional)
  - SANdoctor® (optional)
- More Ways to Grow
  - Flexible port licensing on a single switch
  - Stack switches for quick, easy expansion
  - High-speed modular backbone
- Easy to Install and Manage
  - Installation and configuration wizards
  - On-board graphical user interface (GUI)
  - Manage stacks as a single device
- Fast, Reliable 4Gb/10Gb Performance
  - Nonblocking, full bandwidth architecture
  - Adaptive ISL Trunking
  - I/O StreamGuard™ for registered state change notification (RSCN) suppression
  - Hardware-enforced zoning by worldwide name
  - Hot-swappable dual power supply option
  - Nondisruptive code load and activation (NDCLA)

The Most Cost-Effective Way to Build a SAN

The QLogic 5600Q lets you start small, then scale with your company's needs using state-of-the-art 10Gb Fibre Channel "stacking" technology typically found only in high-end director products. As proven in the Ethernet world, stackable architectures cut costs and increase stability by providing a dedicated, highly-expandable transport for aggregate ISL traffic—eliminating the disruption, port waste, and management hassles associated with the use of regular device ports as ISLs. It's like having the performance and hands-off convenience of an expensive chassis switch without the overhead cost of a chassis!



Need more server or storage ports? Simply add another 5000 Series Switch to the stack. There's no need to move existing cables or disrupt devices—your ISL bandwidth expands automatically with each switch!

Affordable Now—Big Savings Later

- **Low initial cost**—Out of the box, dual-speed QLogic 5600Q Series products provide superior performance at a price-per-port that is competitive with single-speed, non-stacking edge switches.
- **Reduced expansion costs**—With no device ports wasted on ISLs, multiswitch QLogic 5600Q networks require up to 50 percent fewer switches. As your SAN grows, the cables and transceivers required for QLogic 5600Q 10Gb ISLs actually cost *less* per gigabit of bandwidth than using 4Gb ISLs.
- **Longer product and topology lifespan**—Other vendors force customers to take a non-linear "rip and replace" approach to SAN growth, offering a limited solution at the low end, followed by a radically different (and much more expensive) architecture as the installation matures. QLogic's modular ISL backbone helps customers pace investments and deployment activities predictably over time, with fewer wrong turns and reversals—even when corporate strategies and directions change. The QLogic 5600Q ensures that *every* SAN purchase remains a viable part of the infrastructure far into the future.

More Ways to Grow

- **Flexible port licensing on a single switch**—QLogic 5600Q products are available in a range of port-count configurations. As requirements change, it's easy to activate additional ports in four-port increments using the embedded QuickTools interface or the command line interface.

- **High-speed backbone for multiple switches**—When you're ready, simply turn on the plug-and-play stacking ports for the quickest, most cost-effective way to set up a multiswitch SAN. Only QLogic offers industry-standard 10Gb Fibre Channel ISLs on both core and edge switches—you'll never need to unplug a device cable or disrupt a device, no matter how large your fabric grows. Scalability "best practices" are *built into* the QLogic 5600Q architecture!

Easy to Install and Manage

- **Installation and configuration wizards**—From basic switch setup to advanced zoning and extended distance configuration, the QLogic 5600Q has automated routines to make deployment a snap. Installation is a three-step, point-and-click process. Self-configuring switch ports automatically adjust to 4Gb or 2Gb device speeds.
- **On-board GUI**—No software to load. Just point a web browser at any switch and manage the entire fabric from that location. No matter what your level of expertise, the web-based QuickTools interface has everything you need for basic fabric management. For advanced administration of larger SANs, the optional Enterprise Fabric Suite application provides an unprecedented level of intuitive control.
- **Stack Management**—With Enterprise Fabric Suite, you can manage stacks of 5000 Series products as a single device, loading firmware, applying security changes, and handling user and SNMP administration for up to six switches simultaneously.

Fast, Reliable 4Gbps/10Gbps Performance

QLogic 5600Q products provide uncontested full-duplex bandwidth at every port. That's 136Gbps for device ports, plus 102Gbps on the ISL ports—a total of 238Gb of bandwidth per switch! Plus, thanks to the QLogic 10Gb backbone, ISL bandwidth expands automatically as network capacity grows, ensuring a consistent user experience.

- **Nonblocking, full bandwidth architecture**—238Gb of bandwidth per switch. Dedicated 10Gb ISL transport makes it easier to create nonblocking multiswitch configurations.
- **Adaptive Trunking**—No extra cost or complicated license schemes. This built-in QLogic-exclusive trunking feature optimizes ISL usage and performance by pooling the capacity of multiple 10Gb or 4Gb links in a single high-bandwidth pipeline. Trunks are automatically employed as needed, eliminating the need for manual configuration. Unlike other trunking implementations, trunked ports do not need to be sequential, and can even be spread across multiple switches. The industry-standard switch-on-exchange method supports intelligent path selection (IPS), fabric shortest path first (FSPF), and virtual trunking.

A variety of reliability features make the QLogic 5600Q switch capable of delivering overall system availability greater than 99.999 percent.

- **I/O StreamGuard for RSCN suppression**—Guaranteed uninterrupted bandwidth for time-sensitive applications such as video streaming and tape backups.
- **Hardware-enforced zoning by WWN**
- **Hot-swappable dual power supply option**
- **Non-disruptive code load activation (NDCLA)**

Powerful, Intuitive Software

QLogic implements the same code base for the entire QLogic product line, including the popular QLogic 9000 Series Stackable Chassis Switch. Not only are QLogic products backward and forward compatible, you'll only need to learn one set of management tools:

- **QuickTools (included)**—Embedded Java® web applet for device discovery, device management, zoning, and fabric management. QuickTools includes the Configuration Wizard and QLogic's exclusive drag-and-drop zoning—the industry's most intuitive zoning method.
- **Fabric Security (included)**—Provides the right mix of protection features for user, connection, and device security. The 5600Q supports remote authentication dial in-user service (RADIUS), and SSH and SSL encryption. Device connection security conforms to the Fibre Channel Security Protocol (FC-SP), DH-CHAP, and FC-GS-4 CT.
- **Enterprise Fabric Suite (optional)**—Control software costs while managing the SAN *your way* with unprecedented precision. Enterprise Fabric Suite bundles high-value enterprise features in a single site-licensed package, including Fabric Tracker, Performance View, Port Threshold Alarms, Stack Management, and the mPort™ technology movable port activation. You'll spend less time and money licensing individual features and worrying about "balloon payment" per-switch fees as your SAN grows.
- **SANdoctor (optional)**—Comprehensive set of diagnostic tools for troubleshooting problems in your fabric. SANdoctor includes SFP digital diagnostics, Fibre Channel trace route, and Fibre Channel ping.

Interoperability

- **Fully compatible with other QLogic switches**—Mix and match in stacks with all 5000 Series products (2Gb or 4Gb). As always, QLogic's management tools are 100-percent backward compatible with full support for previous-generation switches.
- **Interoperable with all major storage, server, application, and infrastructure vendors**—QLogic products are designed for heterogeneous operating system environments including Windows®, UNIX®, Linux®, AIX®, MacOS®, Solaris® and others. SNMP, an API, and the SMI-S agent are supported for integration into popular third-party management applications.
- **Virtualization Support**—N_Port ID virtualization (NPIV) support comes standard with the QLogic 5600Q, allowing full integration and interoperability with applications such as VMWare® and hardware such as the IBM® Intelligent Pass-thru Module and the HP® VC-FC Blade Switch Modules. Only QLogic delivers end-to-end NPIV support on adapters and switches.

- **FC-SW-2 compliant**—No need to be limited to proprietary SAN products to achieve full function

Investment Protection

Planning to expand to a core-edge topology in the future? Need to add edge connectivity to an existing core infrastructure? No matter where you begin, QLogic 5600Q and QLogic's 10Gb ISL backbone provide the most efficient, cost-effective expansion method. Competing solutions rob increasing numbers of device ports to support growing ISL requirements. With the QLogic 5600Q, there is no "point of diminishing returns" for switch investments and no performance penalty for growth. *Every switch you purchase continues to add value*.

The modular backbone helps you avoid disruptive topology reversals and react faster to changing requirements, including the adoption of new technologies. With the QLogic 5600Q, IT managers can realize a cost-optimized path from the initial-to-ultimate solution without knowing the intervening requirements ahead of time.

Spend your IT dollar on user applications, not infrastructure. SANs exist to support users. Don't let cost and complex infrastructure turn this equation upside down. QLogic 5600Q low total cost of ownership (TCO) products can enhance any company's long-term growth strategy, improving operational efficiency, increasing storage usage—and ultimately making business-critical applications and personnel more productive.

Typical Uses

Environments	Applications
Small stand-alone or departmental/workgroup SANs	E-mail LAN-free backup Disaster recovery Storage/server consolidation DAS-to-SAN migration Video
Edge switch in larger core-edge topologies	E-mail Enterprise resource planning Manufacturing resource planning Storage/server consolidation Data warehousing Video

Why 10Gb Stacking Ports Matter

- Predictable return on investment
- No penalty for growth
- "Best practices" are built into the architecture
- Simple ISL administration
- ISLs are protected from day-to-day changes

Fibre Channel Specifications

Fibre Channel protocols

- Physical Interface (FC-PI-3)
- Line Services (FC-LS)
- Framing and Signaling (FC-FS-2)
- Generic Services (FC-GS, FC-GS-2, FC-GS-3, FCGS-4, FC-GS-5) except for enhanced zoning
- Switch Fabric (FC-SW-2, FC-SW-3, FC-SW-4)
- Arbitrated Loop Rev. 4.6 (FC-AL)
- Arbitrated Loop-2 Rev. 7.0 (FC-AL-2)
- Fibre Loop Attachment (FC-FLA)
- Tape Technical Report (FC-Tape)
- Virtual Interface Architecture Mapping (FC-VI)
- Fabric Element MIB Specification (RFC 2837)
- Fibre Alliance MIB Specification (Version 4.0)
- Methodologies for Interconnects (FC-MI-2)
- Device Attach (FC-DA)
- Security Protocols (FC-SP)

Fibre Channel classes of service

- Class 2, Class 3, and Class F (inter-switch frames) connectionless

Modes of Operation

- Fabric, Public loop, Broadcast

Scalability

Ports per chassis

- Eight to sixteen 4Gbps ports (upgradeable in 4-port increments)
- Four 10Gbps XPAK MSA-compliant ports

Multi-switch fabric support

- All topologies including stack, cascade, cascaded loop, and mesh
- Multiple 10Gb or 4Gb links between switches
- Adaptive trunking, intelligent path selection

Port types

- Universal, auto-discovering, self-configuring: F_Port, FL_Port, E_Port, G_Port, GL_Port

Performance Features

Fabric port speeds

- 4Gbps, 10Gbps full-duplex; 4Gb ports auto-negotiate with slower devices
- Fabric latency less than 0.4µs
- Cut-through routing

Fabric point-to-point bandwidth

- 850MBps full-duplex on 4Gbps ports
- 2550MBps full-duplex on 10Gbps ports

Aggregate bandwidth

- 238Gbps per chassis, end-to-end
- Nonblocking architecture

Maximum frame sizes

- 2148 bytes (2112 byte payload)

Per-port buffering

- ASIC-embedded memory (non-shared)
- Guaranteed 16-credit zero-wait state buffer for full performance up to 13km at 2Gbps, 2km at 10Gbps
- Extended transmission distance through credit donation

Media

- Hot-pluggable, industry-standard 3.3V SFP for 4Gbps ports
- Hot-pluggable, industry-standard XPAK optics or copper stacking cables for 10Gbps ports

Supported SFP types

- Shortwave/longwave (optical), active copper

Media transmission ranges (2Gbps)

- Shortwave optical: 500m (1,640ft)
- Longwave optical: 10km (6.2mi)

Cable types

- 50/62.5 micron multimode fiber optic
- 9 micron single-mode fiber optic

Interoperability

- Compatible with FC-SW-2 compliant switches including Brocade®, Cisco®, and McDATA®
- Management interoperability with leading SAN management applications

Fabric Management

Management methods

- QuickTools Web applet (included)
- CLI (included)
- Enterprise Fabric Suite (optional)
- API, GS-4 Management Server (including FDMI), SNMP, RADIUS, FTP, TFTP, SMI-S

Access methods

- 10/100 Ethernet BaseT (RJ45), serial port (RS-232 with DB9), in-band (Fibre Channel)

Diagnostics

- Power-on self test (POST)
- Optional SANdoctor fabric diagnostics software

Fabric services

- Simple name server, hardware-based zoning, I/O StreamGuard for RSCN suppression, multi-chassis in-order delivery, automatic path selection, FDMI support

User interface

- LEDs, command-line console, and Web utilities

Mechanical/Power/Cooling

Single integrated power supply model

- Rubber mounting feet, mounting brackets
- Optional rack-mount kit

Dual hot-swappable power supply model

- Hot-swappable power supplies, integrated fans
- Optional rack-mount kit
- Front-to-back airflow (both models)
- RoHS compliant

Dimensions

- 5600Q: H×W×D: 43.2×432×305mm (1.7×17×12in)
- 5602Q: H×W×D: 43.2×432×508 mm (1.7×17×20in)

Weight

- 5600Q: 4.08kg (9lbs)
- 5602Q: 6.80kg (15lbs)

Environmental and Equipment Specifications

Operating

- Temperature: 0°–40°C (32°–104°F)
- Humidity: 15–80 percent non-condensing
- Altitude: 0–10,000 feet
- Vibration: 5–500Hz, random, 0.21Grms, 10min
- Shock: 4g, 11ms, 20 repetitions

Non-operating

- Temperature: -40°–70°C (-40°–158°F)
- Humidity: 5–90 percent non-condensing
- Altitude: 0–50,000 feet
- Vibration: 5–500Hz, random, 2.09Grms, 10min
- Shock: 30g, 13msec, trapezoidal

Electrical

- Voltage: 100–240VAC; 50–60Hz
- Power load: 120VAC
- Heat output: 100W maximum

Agency Approvals—Product Safety

- US/Canada: UL/cUL, 60950-1
- Europe: EN60950, CB Scheme-IEC 60950-1, CE, TUV, Low Voltage Directive
- Russia: GOST R
- Argentina: S Mark

Agency Approvals—EMI/EMC

- Meets Class A emissions and immunity requirements for USA, Canada, Europe, Australia, New Zealand, Korea, Japan

QLOGIC®

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